# Preparation of a New Anion Exchange Resin



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## 28. Preparation of a New Anion Exchange Resin

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As well known, dimethylaniline condenses with formaldehyde easily into N-N'-Tetramethyldiaminodiphenylmethane. From this fact man can directly suppose that N, N'-diphenylpiperazine (DP) would condense with formaldehyde and produce a new kind of synthetic resin and this resin would have the character as an anion exchanger. This suggestion was proved to be fact by actual experiment. The results obtained are summerised in the following table :

| exp. No. | DP:$CH_2O$ (35%) (mole ratio) | catalyser | solvent | boiling hrs. | capacity of the obtained resin | | Degree of swelling |
|---|---|---|---|---|---|---|---|
| | | | | | milliequiv. HCl/g resin | milliequiv. HCl/cc resin | |
| 1 | 1 : 4 | Sulfanilic acid | Methanol 20cc | 3 | — (no resinous product) | — | — |
| 2 | 1 : 4 | conc HCl 1cc | Methanol 20cc | 9 | — (tar-like resin) | — | — |
| 3 | 1 : 10 | conc HCl 10cc | Methanol 20cc | 3 | 3.02 | 0 43 | 1.47 |
| 4 | 1 : 10 | N $H_2SO_4$ 1cc | Methanol 40cc | 3 | 2.38 | 0.63 | 1.30 |
| 5 | 1 : 10 | conc $H_2SO_4$ 2cc | Water 8cc | 1.5 | 2.81 | 0.39 | 1.48 |
| 6 | 1 : 10 | 〃 | 〃 | at 50°6hrs boiling 3hrs | 2.81 | 0.88 | 1.23 |
| 7 | 1 : 10 | — | Acetic acid 40cc | 3 | 2.38 | 0.50 | 1.04 |
| 8 | 1 : 10 | $NH_4Cl$ 2g | — | 15 | 3.89 | 0.75 | 2.50 |
| 9 | 1 : 10 | 〃 | — | 20 | 4.57 | 1.03 | 2.07 |
| 10 | 1 : 10 | 〃 1g | — | 10 | 3.89 | 0.88 | 2.60 |

In each case 2g DP were used.
The calculated capacity is ca. 8 milliequiv. HCl/g resin.

## 29. Syntheses of Non-ionic Surface Active Agents. (II)

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The authors prepared some non-ionic surface active agents of ethanolamides derivatives.

A) Lauric-acid-ethanolamides and their polyethyleneoxide condensation-products